

2019 Triennial Review of Water Quality Standards
Documentation of Changes to the List of Tier II High Quality Waters



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Contributing Authors: Kara Ogburn and Matthew Stover

Water Quality Standards Section

Water and Science Administration

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Statement of Purpose

The purpose of this document is to highlight and provide the detail which explains the changes made to the list of Tier II waters found in Code of Maryland Regulations (COMAR) 26.08.02.04-2 N.

This document was created in preparation for Maryland's 2019 Triennial Review of Water Quality Standards (TR) so as to provide supporting information that explains the reasoning behind changes to Maryland's list of Tier II waters. As such, this document will accompany the proposed regulation changes and be provided to the public for review and comment at the same time. Since this document memorializes these changes, it should therefore be saved in any location where information on the 2019 TR is stored and in any location where information on Tier II waters designation is stored.

Clarification of Regulatory References

Prior to the regulatory changes made as part of Maryland's 2019 Triennial Review of Water Quality Standards (these regulatory changes weren't actually adopted until 2021), Maryland's Tier II Antidegradation Policy Implementation Procedures, which capture the list of Tier II waters, were found in Code of Maryland Regulations (COMAR) 26.08.02.04-1. Thus, when this document references the list of Tier II waters at some previous time, prior to the regulatory change made in 2021, it will refer to the list of Tier II waters as existing in COMAR 26.08.02.04-1 O. As part of the regulatory changes (occurring in 2021) associated with Maryland's 2019 Triennial Review of Water Quality Standards, the Tier II Antidegradation Policy Implementation Procedures will be described in COMAR 26.08.02.04-2. Thus, when this document refers to how these changes to Tier II designations will be reflected in the list of Tier II waters of the revised regulations it will refer to the Tier II Antidegradation Policy Implementation Procedures as existing in COMAR 26.08.02.04-2 with the list of Tier II waters being found in section N.

Steps in Identifying Necessary Corrections and New Tier II Waters Identified

In partnership with the Department of Natural Resources, who collects the MBSS benthic and fish data, information is periodically reassessed for quality assurance purposes. After the most recent reassessment, a spreadsheet was created identifying all discrepancies and metadata to explain each change made to previous data. One change involved corrections to the coordinates for several sampling events which led one stream to be incorrectly designated as Tier II. As a result, this stream will be removed from the Tier II list. Another three streams were

found to have recalculated baseline scores but this did not lead to a removal of the Tier II designation. There were two streams that were not listed in COMAR 26.08.02.04-1, but records indicate that they should have been previously designated under Tier II protections. These two streams will be added to the Tier II list. Finally, all streams were reassessed using recently collected data to determine if any new additions should be made to the Tier II list. Eleven segments were found that have scores high enough to be newly designated as Tier II in COMAR 26.08.02.04-2.

Summary of Modifications to the Tier II List in COMAR 26.08.02.04-2 N

The tables immediately below provide brief descriptions of the changes proposed to the list of Tier II waters in COMAR 26.08.02.04-2 N. This document describes four types of changes to the list of Tier II waters which include:

- Tier II designation removal
- Tier II baseline score correction
- The reinclusion of Tier II segments erroneously removed from the list of Tier II waters
- Newly designated Tier II stream segments

These changes are discussed in further detail within the following sections of this document.

Table 1. Stream segment proposed for removal from the list of Tier II waters.

Tier II Stream Name	County	From Lat	From Long	To Lat	To Long	Reason for Proposed Adjustment	Summary
Bear Creek 1	Garrett	39.65018	-79.28886	39.65046	-79.298011	Location correction	A sampling event with high scores was incorrectly shown on an adjacent stream segment. Stream should not have been designated as Tier II.

Table 2. Tier II stream segments with baseline score corrections.

Tier II Stream Name	County	From Lat	From Long	To Lat	To Long	Reason for Proposed Adjustment	Summary
Bear Creek 4	Garrett	39.56476	-79.32195	39.65018	-79.28886	Baseline Score Correction	A site with high scores was missing from original calculations. When correctly added to the average for Bear Creek 4, the baseline scores changed.
Principio Creek UT 1	Cecil	39.61544	-76.05885	39.60709	-76.03070	Baseline Score Correction	Recalculated baseline score to reflect year of designation in

							accordance with sampling events used to calculate scores.
Timber Run 1	Baltimore Co.	39.44400	-76.84151	39.43794	-76.86878	Baseline Score Correction	Baseline FIBI corrected to 4.57 instead of the current 4.67 score due to a transcription error.

Table 3. Stream segments erroneously removed from Tier II list in 2018, to be added back with Tier II designation.

Tier II Stream Name	County	From Lat	From Long	To Lat	To Long	Reason for Proposed Adjustment	Summary
North Branch Patapsco River UT 2	Baltimore Co.	39.494629	-76.86357	39.49571	-76.837947	Erroneously removed from the Tier II list in 2018	This Tier II water was erroneously removed from the Tier II list. Re-evaluation confirmed Tier II designation
Saint Clements Creek 2	Saint Mary's	38.358656	-76.727069	38.34856	-76.73058	Erroneously removed from the Tier II list in 2018	This Tier II water was erroneously removed from the Tier II list. Re-evaluation confirmed Tier II designation.

Table 4. New Tier II Stream segments.

Tier II Stream Name	County	From Lat	From Long	To Lat	To Long	Reason for Proposed Adjustment	Summary
Laurel Run 1	Garrett	39.688371	-79.449636	39.6877	-79.439537	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI \geq 4.00) justifying Tier II designation.
Sand Spring Run 1	Garrett	39.257794	-79.473281	39.272048	-79.474658	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI \geq 4.00) justifying Tier II designation
Bush Cabin Run 1	Baltimore	39.599083	-76.707107	39.61048	-76.681793	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI \geq 4.00) justifying Tier II designation
Deer Creek 1	Baltimore	39.713068	-76.597628	39.70742	-76.590096	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI \geq 4.00) justifying Tier II designation
Deer Creek 9	Baltimore	39.72117	-76.609265	39.713068	-76.597628	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI \geq 4.00) justifying Tier II designation
Mill Run 5	Charles	38.52755	-77.078741	38.52029	-77.090089	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI \geq 4.00) justifying Tier II designation

Timothy Branch 1	Prince George's	38.710667	-76.854371	38.664667	-76.878959	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI \geq 4.00) justifying Tier II designation
Wilson Owens Branch 1	Anne Arundel	38.825626	-76.68624	38.825834	-76.697119	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI \geq 4.00) justifying Tier II designation
District Branch 1	Prince George's	38.866772	-76.719393	38.854804	-76.691683	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI \geq 4.00) justifying Tier II designation
Morgan Creek UT 1	Kent	39.306198	-76.016172	39.289815	-76.020911	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI \geq 4.00) justifying Tier II designation
Fannels Branch 1	Kent	39.189562	-76.107898	39.187236	-76.113317	Newly identified Tier II stream	Recently collected data demonstrates high quality water (BIBI and FIBI \geq 4.00) justifying Tier II designation

Tier II Segment Proposed for Deletion

Bear Creek 1

Table 5: Tier II stream as shown in COMAR 26.08.02.04-1 on 8/19/2020.

Date	Stream Name	County	12-digit Watershed	From Lat	From Long	To Lat	To Long	Baseline FIBI	Baseline BIBI
2003	Bear Creek	Garrett	050202010018	39.65018	-79.28886	39.65046	-79.298011	4.43	4.07

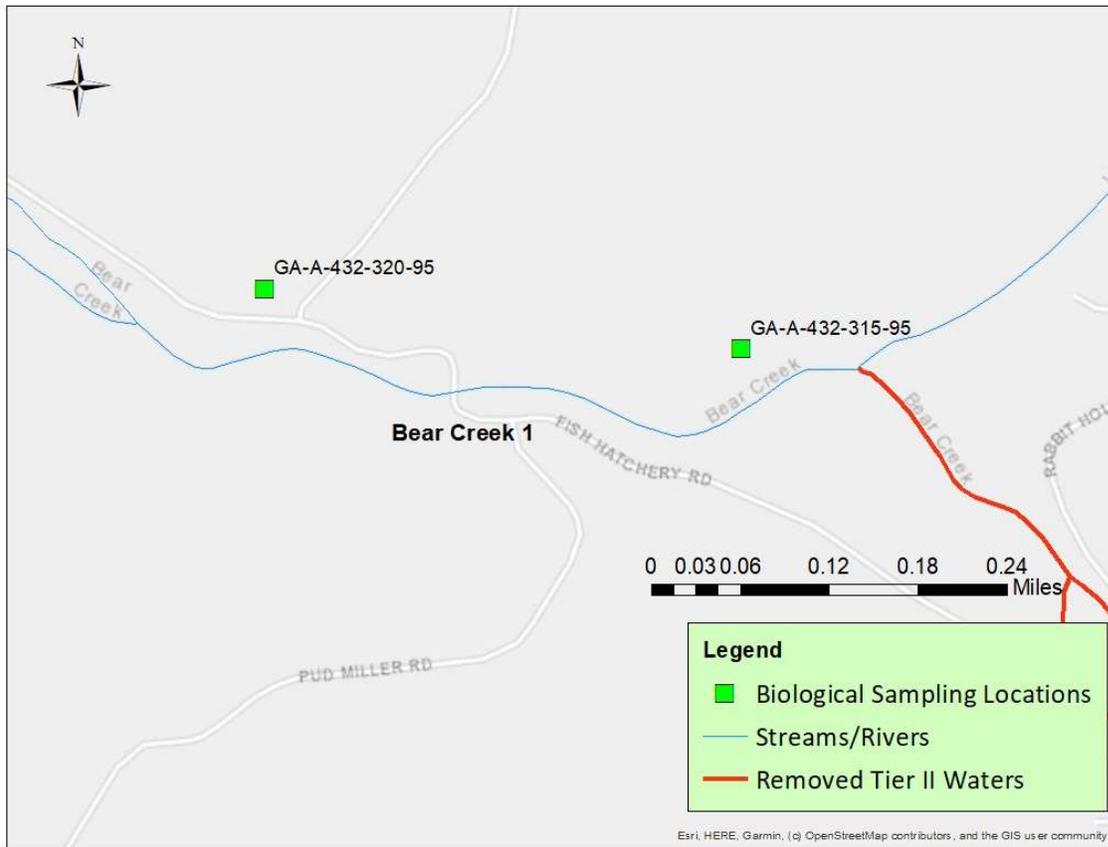


Figure 1: Map of Tier II stream segment proposed for removal, Bear Creek 1. When this segment was originally designated as Tier II, the coordinates for MBSS sampling events Y0UG-432-S-2000, Y0UG-432-S-2001, Y0UG-432-S-2002, Y0UG-432-S-2003, and Y0UG-432-S-2004 originally had them located on the Bear Creek 1 segment. However, additional review revealed that these sampling events occurred along the segment to the southeast of Bear Creek 1.

Table 6: MBSS data used to originally designate Bear Creek 1 as Tier II. During the Tier II designation in 2003, all of the YOUG-432-S sampling events (highlighted in yellow) were incorrectly plotted on the Bear Creek 1 segment leading to an average BIBI and FBI that resulted in an inappropriate Tier II designation.

Sampling Event Identifier	Stream Name	Latitude	Longitude	Catchment Size (Acres)	Data Source	FBI Score	BIBI Score	Year of Sampling
GA-A-432-315-95	Bear Creek 1	39.650346692	-79.290343010	9914.68	Department of Natural Resources	4.67	3.75	1995
GA-A-432-320-95	Bear Creek 1	39.650817523	-79.296390670	10216.71	Department of Natural Resources	4.67	2.00	1995
YOUG-432-S-2000	Bear Creek 1	39.650264	-79.290586	5606.99	Department of Natural Resources	4.00	4.75	2000
YOUG-432-S-2001	Bear Creek 1	39.650264	-79.290586	5606.99	Department of Natural Resources	4.33	4.50	2001
YOUG-432-S-2002	Bear Creek 1	39.650264	-79.290586	5606.99	Department of Natural Resources	4.00	4.75	2002
YOUG-432-S-2003	Bear Creek 1	39.650264	-79.290586	5606.99	Department of Natural Resources	4.67	4.00	2003
YOUG-432-S-2004	Bear Creek 1	39.650264	-79.290586	5606.99	Department of Natural Resources	4.67	4.50	2004
					Average	4.43	4.07	

Table 7: Correct MBSS sampling events to use in evaluating this segment for Tier II designation. The averaged BIBI (highlighted) from these stations does not attain the Tier II threshold of 4.00.

Sampling Event Identifier	Stream Name	Latitude	Longitude	Catchment Size (Acres)	Data Source	FBI Score	BIBI Score	Year of Sampling
GA-A-432-315-95	Bear Creek 1	39.650346692	-79.290343010		Department of Natural Resources	4.67	3.75	1995
GA-A-432-320-95	Bear Creek 1	39.650817523	-79.296390670		Department of Natural Resources	4.67	2.00	1995
					Average	4.67	2.875	

History of the Original Tier II Designation

This segment of Bear Creek was designated as a high-quality, Tier II stream in 2003 with an average FIBI score of 4.43 and a BIBI of 4.07 (Table 6). At the time, the coordinates for MBSS sampling events YOUG-432-S-2000, YOUG-432-S-2001, YOUG-432-S-2002, YOUG-432-S-2003, and YOUG-432-S-2004 showed them as being located on the Bear Creek 1 segment along with the sampling events GA-A-432-315-95 and GA-A-432-320-95. As per Tier II designation protocols, the BIBI and FIBI scores for all of these sampling events were averaged together and the resulting average BIBI and FIBI each exceeded 4.00. Thus this stream segment was designated as Tier II. However, after conferring with DNR staff, the location of the YOUG-432-S sentinel sites was confirmed to be on the stream segment to the southeast of Bear Creek 1 (currently designated as Tier II segment Bear Creek 4) and not on Bear Creek 1 as originally thought.

Justification for the Tier II Removal

After correcting the location of the YOUG-432-S sampling events to plot on a different segment, MDE staff reassessed this data for meeting the Tier II threshold. Since MDE's procedure for identifying Tier II waters is to average the IBI scores for MBSS stations sampled on the same stream reach, the assessors averaged the IBI scores from GA-A-432-315-95 and GA-A-432-320-95 giving an average BIBI of 2.875 and an average FIBI of 4.67. Since the average BIBI was below the Tier II threshold of 4.00 this assessment resulted in no Tier II designation and therefore resulted in removing the Bear Creek 1 segment from the list of Tier II waters.

Tier II Segment with Revised Baseline IBI Scores

Bear Creek 4

Table 8: Tier II stream as shown in COMAR 26.08.02.04-1 on 8/19/2020.

Date	Stream Name	County	12-digit Watershed	From Lat	From Long	To Lat	To Long	Baseline FIBI	Baseline BIBI
2008	Bear Creek 4	Garrett	050202010016	39.56476	-79.32195	39.65018	-79.28886	4.00	4.50

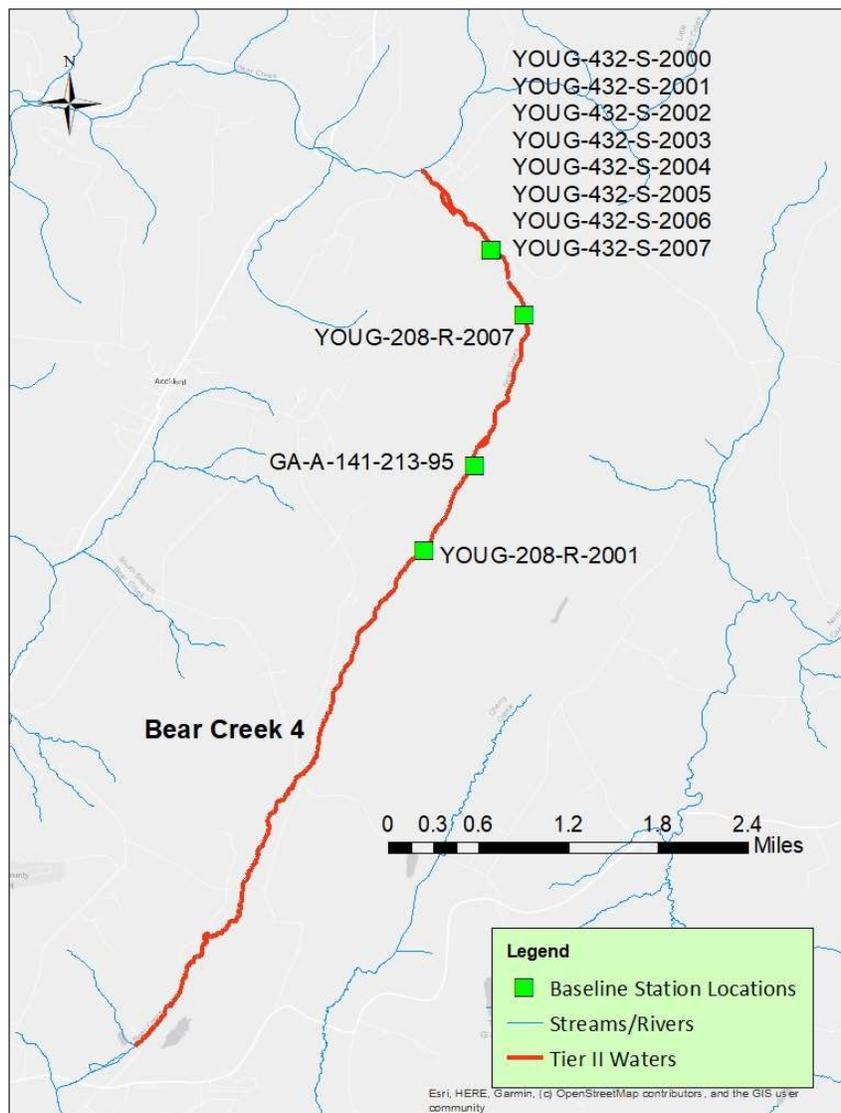


Figure 2: Map of the Bear Creek 4 Tier II stream segment and all nearby biological monitoring sites.

Table 9: MBSS data used in the original Tier II designation. Note that the YOUG-432-S sampling events sampled between 2000 and 2004 were not included.

Sampling Event Identifier	Stream Name	Latitude	Longitude	Catchment Size (Acres)	Data Source	FIBI Score	BIBI Score	Year of Sampling
GA-A-141-213-95	Bear Creek 4	39.621685	-79.281290	4357.98	Department of Natural Resources	4.50	4.75	1995
YOUG-208-R-2001	Bear Creek 4	39.613426	-79.287329	3980.89	Department of Natural Resources	3.50	4.25	2001
					Average:	4.00	4.50	

Table 10: Correct MBSS sampling events included in the calculation of the baseline IBI scores.

Sampling Event Identifier	Stream Name	Latitude	Longitude	Catchment Size (Acres)	Data Source	FIBI Score	BIBI Score	Year of Sampling
GA-A-141-213-95	Bear Creek 4	39.621685	-79.281290	4357.98	Department of Natural Resources	4.50	4.75	1995
YOUG-208-R-2001	Bear Creek 4	39.613426	-79.287329	3980.89	Department of Natural Resources	3.50	4.25	2001
YOUG-432-S-2000	Bear Creek 4	39.650264	-79.290586	5606.99	Department of Natural Resources	4.50	4.75	2000
YOUG-432-S-2001	Bear Creek 4	39.650264	-79.290586	5606.99	Department of Natural Resources	4.50	4.50	2001
YOUG-432-S-2002	Bear Creek 4	39.650264	-79.290586	5606.99	Department of Natural Resources	4.50	4.75	2002
YOUG-432-S-2003	Bear Creek 4	39.650264	-79.290586	5606.99	Department of Natural Resources	3.50	4.00	2003
YOUG-432-S-2004	Bear Creek 4	39.650264	-79.290586	5606.99	Department of Natural Resources	4.00	4.50	2004
YOUG-432-S-2005	Bear Creek 4	39.636420	-79.275460	5606.99	Department of Natural Resources	Not sampled	3.75	2005
YOUG-432-S-2006	Bear Creek 4	39.650264	-79.290586	5606.99	Department of Natural Resources	Not sampled	4.25	2006
YOUG-432-S-2007	Bear Creek 4	39.650264	-79.290586	5606.99	Department of Natural Resources	4.50	4.25	2007

YOUG-208-R-2007	Bear Creek 4	39.636420	-79.275460	5118.05212	Department of Natural Resources	4.50	4.50	2007
					Average:	4.22	4.39	

Table 11: Tier II stream information with the corrected baseline IBI scores.

Date	Stream Name	County	12-digit Watershed	From Lat	From Long	To Lat	To Long	Baseline FIBI	Baseline BIBI
2008	Bear Creek 4	Garrett	050202010016	39.56476	-79.32195	39.65018	-79.28886	4.22	4.39

Description of Changes and Rationale

At the time Bear Creek 4 was designated as Tier II in 2007, MDE only used the MBSS scores from two sampling events, GA-A-141-213-95 and YOUG-208-R-2001. Using only these two stations led to an average baseline BIBI of 4.50 and an average baseline FIBI of 4.00. Unknown at the time was that the sampling events YOUG-432-S-2000, YOUG-432-S-2001, YOUG-432-S-2002, YOUG-432-S-2003, and YOUG-432-S-2004 had incorrect coordinates that placed them on another stream segment to the northwest. Instead, these sampling events were in fact sampled on the Bear Creek 4 stream segment. After confirming this mistake, these sampling events, which would have been otherwise included in the baseline IBI score calculations, were added to the Tier II baseline dataset and the baseline scores recalculated. Adding these sampling events, along with others sampled at this MBSS sentinel site, to the baseline dataset for Bear Creek 4 results in an average baseline BIBI of 4.38 and an average baseline FIBI of 4.25. With these baseline IBI score corrections, Bear Creek 4 still meets or exceeds the Tier II IBI threshold of 4.00 and therefore will continue to be listed as Tier II in COMAR 26.08.02.04-2, albeit with revised baseline IBI scores.

Principio Creek UT 1

Table 12: Tier II stream as shown in COMAR 26.08.02.04-1 on 8/19/2020.

Date	Stream Name	County	12-digit Watershed	From Lat	From Long	To Lat	To Long	Baseline FIBI	Baseline BIBI
2003	Principio Creek UT 1	Cecil	021306090380	39.61544	-76.05885	39.60709	-76.03070	4.00	4.67

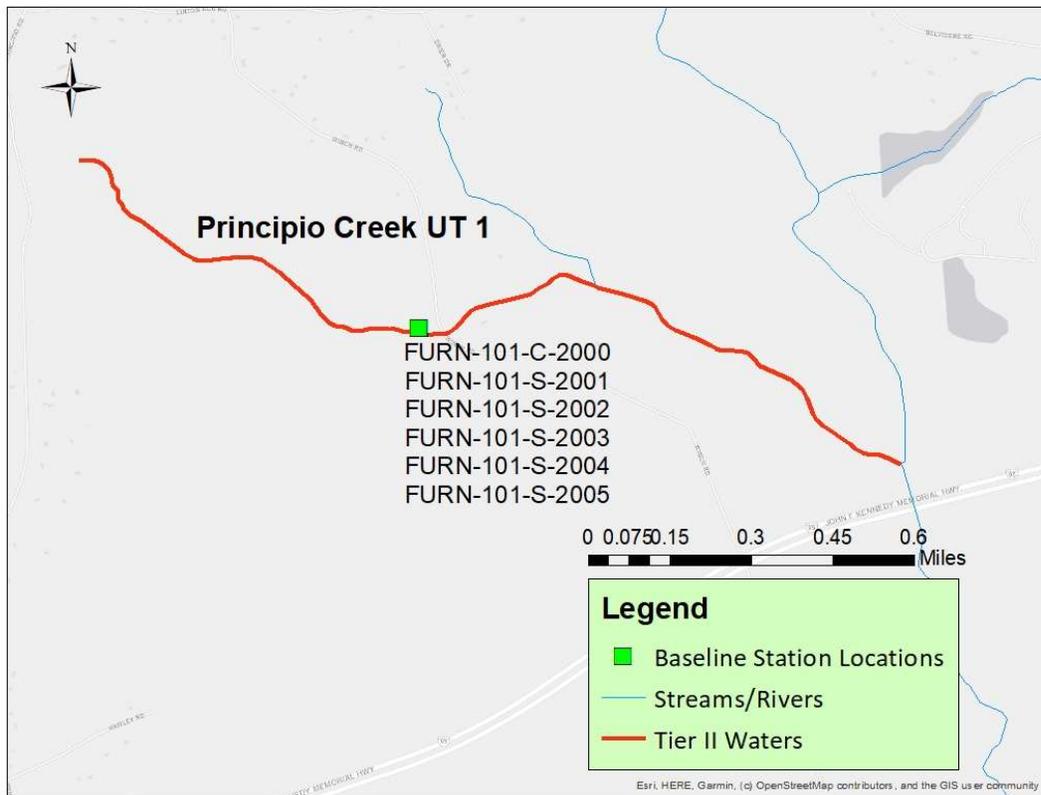


Figure 3: Map for Tier II stream segment Principio Creek UT 1.

Table 13: MBSS data used in the original Tier II designation. Note that the sampling events in 2003, 2004, and 2005 (highlighted) were erroneously included.

Sampling Event Identifier	Stream Name	Latitude	Longitude	Catchment Size (Acres)	Data Source	FIBI Score	BIBI Score	Year of Sampling
FURN-101-C-2000	Principio Creek UT 1	39.610554	-76.046112	716.724	Department of Natural Resources	4.00	5.00	2000
FURN-101-S-2001	Principio Creek UT 1	39.610554	-76.046112	716.724	Department of Natural Resources	4.00	4.67	2001

FURN-101-S-2002	Principio Creek UT 1	39.610554	-76.046112	716.724	Department of Natural Resources	4.67	5.00	2002
FURN-101-S-2003	Principio Creek UT 1	39.610554	-76.046112	716.724	Department of Natural Resources	3.33	4.33	2003
FURN-101-S-2004	Principio Creek UT 1	39.610554	-76.046112	716.724	Department of Natural Resources	4.00	4.00	2004
FURN-101-S-2005	Principio Creek UT 1	39.610554	-76.046112	716.724	Department of Natural Resources	4.00	5.00	2005
					Total:	4.00	4.67	

Table 14: Stations used to calculate revised FIBI and BIBI baseline scores.

Sampling Event Identifier	Stream Name	Latitude	Longitude	Catchment Size (Acres)	Data Source	FIBI Score	BIBI Score
FURN-101-C-2000	Principio Creek UT 1	39.610554	-76.046112	716.724	Department of Natural Resources	4.00	5.00
FURN-101-S-2001	Principio Creek UT 1	39.610554	-76.046112	716.724	Department of Natural Resources	4.00	4.67
FURN-101-S-2002	Principio Creek UT 1	39.610554	-76.046112	716.724	Department of Natural Resources	4.67	5.00
					Total:	4.22	4.89

Table 15: Tier II Stream Principio Creek UT1 with baseline IBI score revisions and how it should appear in COMAR 26.08.02.04-2.

Date	Stream Name	County	12-digit Watershed	From Lat	From Long	To Lat	To Long	Baseline FIBI	Baseline BIBI
2003	Principio Creek UT 1	Cecil	021306090380	39.61544	-76.05885	39.60709	-76.03070	4.22	4.89

Description of Changes and Rationale

Principio Creek UT 1 was designated as a Tier II stream segment in 2003. This segment was designated with average baseline IBI scores with a FIBI of 4.00 and BIBI of 4.67. The MBSS scores used to calculate these baseline scores included IBIs from sampling events FURN-101-S-2000, FURN-101-S-2001, FURN-101-S-2002, FURN-101-S-2003, FURN-101-S-2004 and FURN-

101-S-2005 (table 13). However, since Principio Creek UT 1 was designated as Tier II in 2003, assessors would not have had the scores from the stations sampled in 2003, 2004, and 2005. As a result, MDE is correcting the baseline IBI scores to only include those stations for which MDE would have had data at the time of the designation (2003). Thus, the corrected baseline IBI scores now include only the scores from stations sampled prior to the 2003 designation date (FURN-101-S-2000, FURN-101-S-2001, and FURN-101-S-2002). This results in a baseline BIBI of 4.89 and a baseline FIBI of 4.22 (table 14).

Timber Run 1

Table 16: Tier II stream as shown in COMAR 26.08.02.04-1 on 8/19/2020.

Date	Stream Name	County	12-digit Watershed	From Lat	From Long	To Lat	To Long	Baseline FIBI	Baseline BIBI
2003	Timber Run 1	Baltimore Co.	021309071048	39.44400	-76.84151	39.43794	-76.86878	4.48	4.67

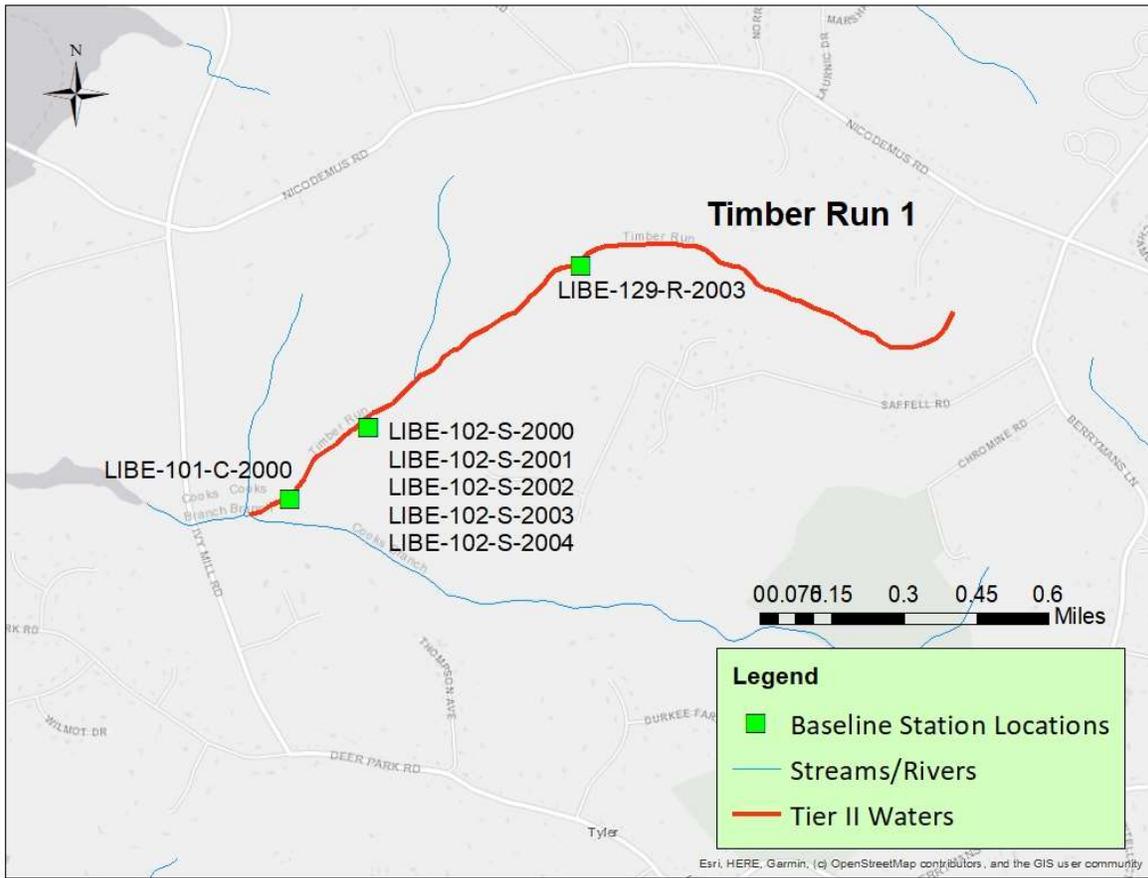


Figure 4: Map of Tier II stream segment Timber Run 1 and biological monitoring sites located along this segment.

Table 17: MBSS data used to determine Baseline scores for Timber Run 1 stream segment in 2003.

Sampling Event Identifier	Stream Name	Latitude	Longitude	Catchment Size (Acres)	Data Source	FIBI Score	BIBI Score
LIBE-101-C-2000	Timber Run 1	39.4405540	-76.8641670	601.234	Department of Natural Resources	4.67	5.00
LIBE-102-S-2000	Timber Run 1	39.4405540	-76.8641670	584.092	Department of Natural Resources	5.00	4.67
LIBE-102-S-2001	Timber Run 1	39.4405540	-76.8641670	584.092	Department of Natural Resources	4.67	5.00
LIBE-102-S-2002	Timber Run 1	39.4405540	-76.8641670	584.092	Department of Natural Resources	5.00	4.33
LIBE-129-R-2003	Timber Run 1	39.4454114	-76.8559326	328.653	Department of Natural Resources	3.67	4.33
LIBE-102-S-2003	Timber Run 1	39.4405540	-76.8641670	584.092	Department of Natural Resources	3.67	4.00
LIBE-102-S-2004	Timber Run 1	39.4405540	-76.8641670	584.092	Department of Natural Resources	4.67	4.67
					Total:	4.48	4.57

Table 18: Tier II Stream with proposed baseline FIBI revision and how it should appear in COMAR 26.08.02.04-2.

Date	Stream Name	County	12-digit Watershed	From Lat	From Long	To Lat	To Long	Baseline FIBI	Baseline BIBI
2005	Timber Run 1	Baltimore Co.	021309071048	39.44400	-76.84151	39.43794	-76.86878	4.48	4.57

Description of Changes and Rationale

The Timber Run 1 Tier II segment was listed as being designated as Tier II in 2003 with a FIBI score of 4.48 and a BIBI score of 4.67. However, the Department’s QA/QC process found an incorrect year of designation (which should have been 2005 instead of 2003) and recalculated the scores for this stream to find the baseline FIBI average to be 4.57 instead of 4.67. Table 17 shows the data used in averaging the baseline scores. In this case, no individual scores changed after the original designation. The only difference found was the contrasting BIBI averages, to which we can conclude a transcription error occurred. The correct BIBI score should be recorded as 4.57 in COMAR 26.08.02.04-2 and the year of designation should be corrected to 2005.

Tier II Segments Erroneously Removed from the Tier II Waters List in 2018 and Now Being Re-Included

North Branch Patapsco River UT 2

Table 19: MBSS data used to designate this segment as Tier II in 2011.

Sampling Event Identifier	Stream Name	Latitude	Longitude	Catchment Size (Acres)	Data Source	FIBI Score	BIBI Score	Year of Sampling
BA-P-008-101-95	North Branch Patapsco River UT 2	39.494438	-76.862464	608.81	Department of Natural Resources	4.67	4.67	1995
LIBE-113-R-2000	North Branch Patapsco River UT 2	39.495484	-76.852320	291.836	Department of Natural Resources	2.67*	4.00	2000
LIBE-117-R-2000	North Branch Patapsco River UT 2	39.496478	-76.855851	339.189	Department of Natural Resources	3.67	5.00	2000
Total:						4.17	4.56	

*Please note that the FIBI score from LIBE-113-R-2000 was removed from this averaging process according to the Department’s vetting rules for biological data. These vetting rules state that “Sampling locations with less than a 300-acre catchment or watershed often have limited fish habitat and naturally low fish diversity. As a result, the F-IBI will not be used for assessment decisions at these sites unless the score is significantly greater than 3” (MDE Biological Assessment Methodology for Non-Tidal Wadable Streams, 2014).

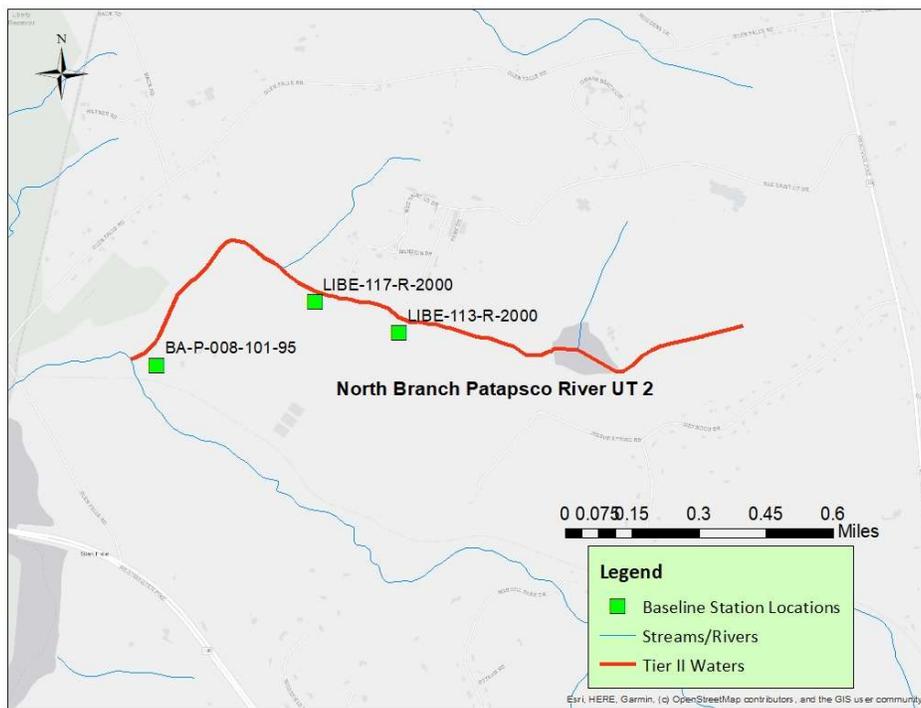


Figure 5: Map of Tier II stream segment North Branch Patapsco River UT 2 and associated biological monitoring sites.

Table 20: Tier II stream information as it should appear in COMAR 26.08.02.04-2.

Date	Stream Name	County	12-digit Watershed	From Lat	From Long	To Lat	To Long	Baseline FIBI	Baseline BIBI
2011	North Branch Patapsco River UT 2	Baltimore Co.	021309071048	39.494629	-76.86357	39.49571	-76.837947	4.17	4.56

Description of Changes and Rationale

North Branch Patapsco River UT 2 was originally designated as Tier II in 2011. Three MBSS stations (BA-P-008-101-95, LIBE-113-R-2000, and LIBE-117-R-2000) were used in the original assessment and designation. Consistent with Tier II designation protocols, the FIBIs and BIBIs were independently averaged with the resulting average FIBI and BIBI being 4.17 and 4.56, respectively.

For an unknown reason, the Tier II stream North Branch Patapsco River UT 2 was removed from the list of Tier II waters in 2018 when changes were made to the list of Tier II waters in COMAR 26.08.02.04-1 as a result of Maryland’s Triennial Review of Water Quality Standards. Later, upon initiating Maryland’s 2019 Triennial Review of Water Quality Standards, MDE staff found that this water had been erroneously removed from the list of Tier II waters and marked it for re-inclusion.

Saint Clements Creek 2

Table 21: MBSS data used to designate this segment as Tier II in 2011.

Sampling Event Identifier	Stream Name	Latitude83	Longitude83	Catchment Size (Acres)	Data Source	FIBI Score	BIBI Score	Year of Sampling
SM-S-199-302-95	Saint Clements Creek 2	38.348494	-76.729949	9600	Department of Natural Resources	4.33	4.71	1995

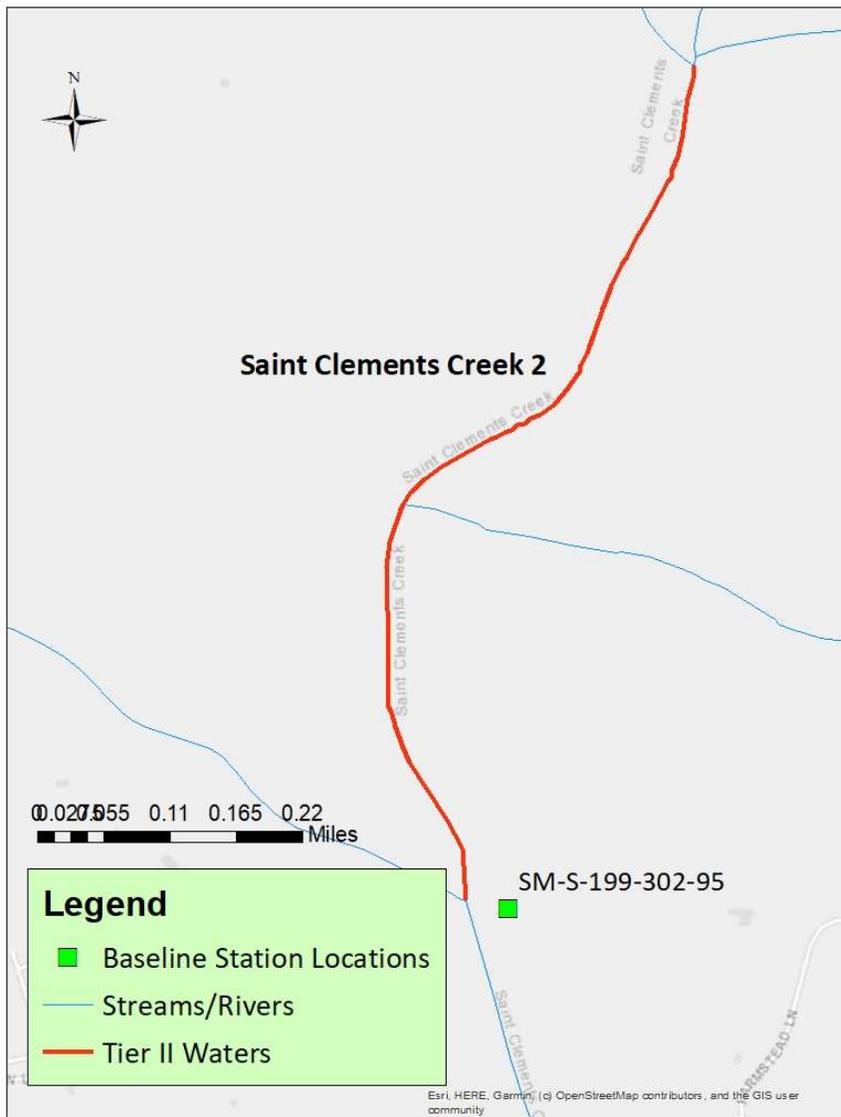


Figure 6: Map of Tier II stream segment Saint Clements Creek 2 and associated biological monitoring site.

Table 22: Tier II stream information as it should appear in COMAR 26.08.02.04-2.

Date	Stream Name	County	12-digit Watershed	From Lat	From Long	To Lat	To Long	Baseline FIBI	Baseline BIBI
2011	Saint Clements Creek 2	Saint Mary's	021401050730	38.358656	-76.727069	38.348588	-76.730607	4.33	4.71

Description of Changes and Rationale

Saint Clements Creek 2 was originally designated as Tier II in 2011. One MBSS sampling event (SM-S-199-302-95) from 1995 with a FIBI score of 4.33 and a BIBI score of 4.71 was used in the original assessment and designation. For some unknown reason, the Tier II segment Saint Clements Creek 2 was removed from the list of Tier II waters in 2018 when changes were made to the list of Tier II waters in COMAR 26.08.02.04-1 as a result of Maryland’s Triennial Review of Water Quality Standards. Later, upon initiating Maryland’s 2019 Triennial Review of Water Quality Standards, MDE staff found that this water had been erroneously removed from the list of Tier II waters and marked it for re-inclusion.

New Tier II Stream Identification

Laurel Run 1

Table 23: Maryland Biological Stream Survey data used to identify Laurel Run 1 as a new Tier II stream.

Sampling Event Identifier	Stream Name	Latitude	Longitude	Catchment Size (Acres)	Data Source	FIBI Score	BIBI Score	Year of Sampling
YOUG-207-X-2015	Laurel Run 1	39.68822	-79.44122	2004.59	Department of Natural Resources	4.00	4.25	2015

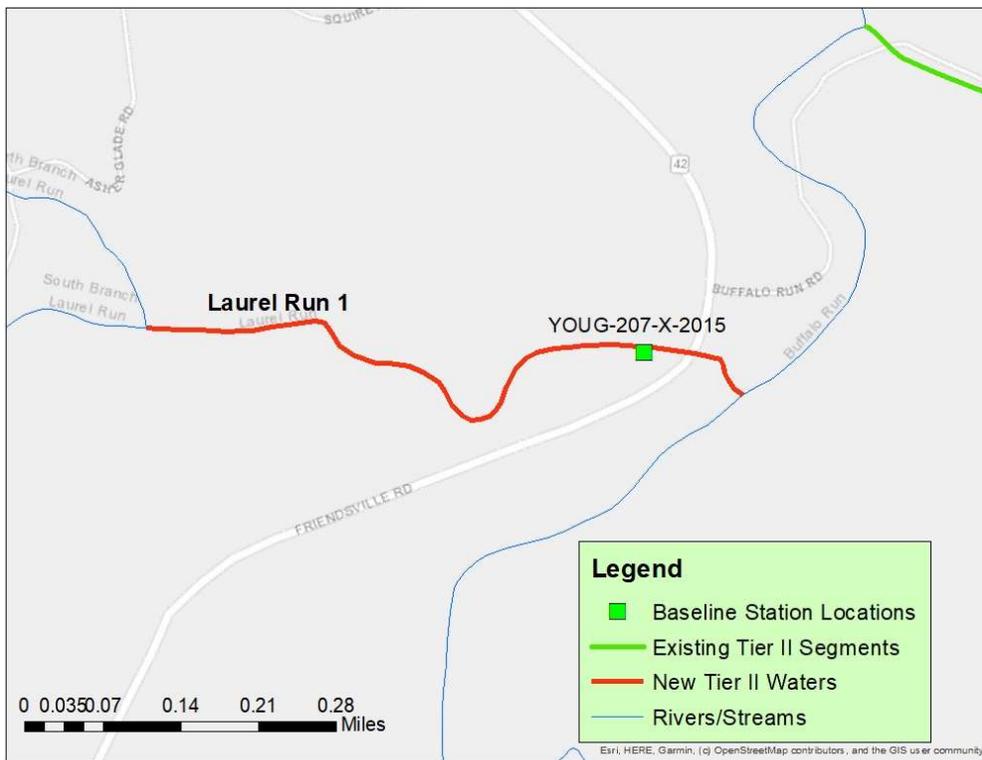


Figure 7: Map of the newly identified Tier II segment Laurel Run 1.

Table 24: New Tier II segment Laurel Run 1 as it will be displayed in COMAR 26.08.02.04-2.

Date	Stream Name	County	12-digit Watershed	From Lat	From Long	To Lat	To Long	Baseline FIBI	Baseline BIBI
2021	Laurel Run 1	Garrett	050202010019	39.688371	-79.449636	39.6877	-79.439537	4.00	4.25

Description:

Laurel Run 1 was designated as a Tier II water on the basis of data collected at the DNR Maryland Biological Stream Survey station (YOUG-207-X-2015) that was sampled in 2015 and which had a BIBI score of 4.25 and a FIBI score of 4.00. Since this is the only site within this stream segment and both IBI scores are above 4.00, this segment was added to the Tier II waters list in COMAR 26.08.02.04-2.

Sand Spring Run 1

Table 25: Maryland Biological Stream Survey data used to identify Sand Spring Run 1 as a new Tier II stream.

Sampling Event Identifier	Stream Name	Latitude	Longitude	Catchment Size	Data Source	FIBI Score	BIBI Score	Year of Sampling
YOUG-101-X-2015	Sand Spring Run 1	39.26899	-79.47029	491.349	Department of Natural Resources	4.00	4.25	2015

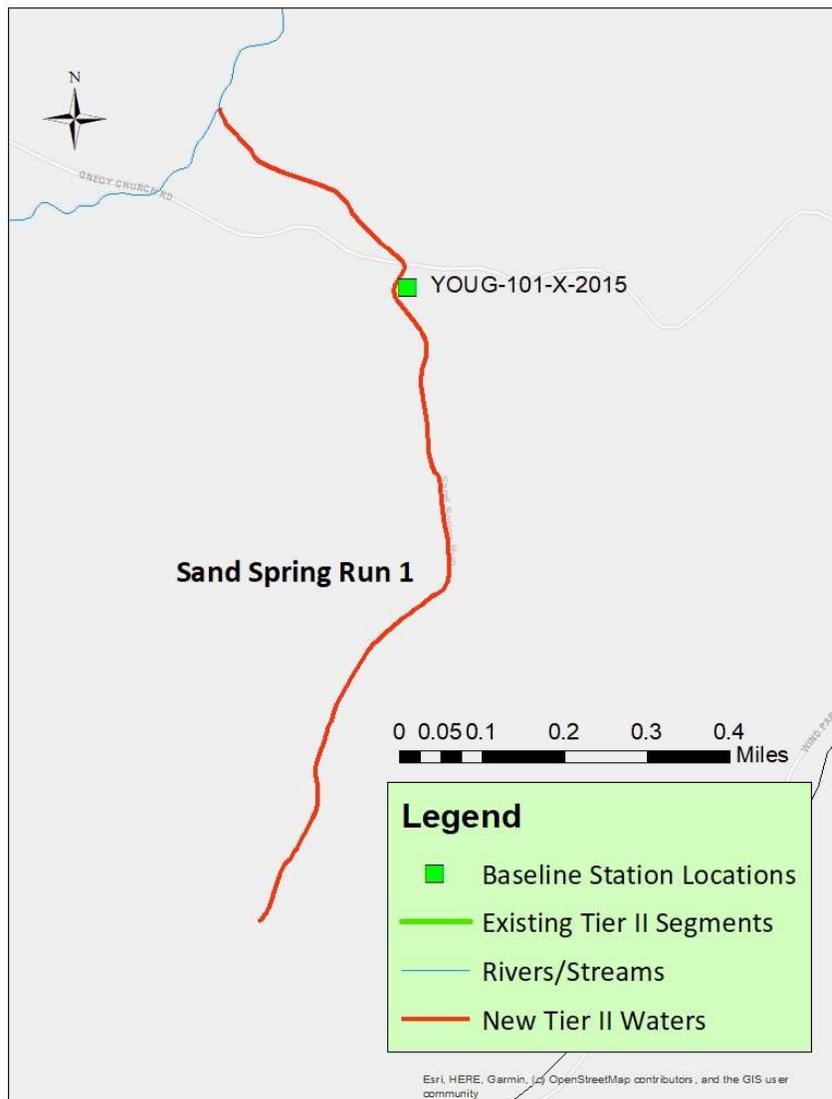


Figure 8: Map of the newly identified Tier II segment Sand Spring Run 1.

Table 26: New Tier II segment Sand Spring Run 1 as it will be displayed in COMAR 26.08.02.04-2.

Date	Stream Name	County	12-digit Watershed	From Lat	From Long	To Lat	To Long	Baseline FIBI	Baseline BIBI
2021	Sand Spring Run 1	Garrett	050202010001	39.257794	-79.473281	39.272048	-79.474658	4.00	4.25

Description:

Sand Spring Run 1 was designated as a Tier II water on the basis of data collected at the DNR Maryland Biological Stream Survey station (YOUG-101-X-2015) that was sampled in 2015 and which had a BIBI score of 4.25 and a FIBI score of 4.00. Since this is the only site within this stream segment and both IBI scores are above 4.00, this segment will be added to the Tier II waters list in COMAR 26.08.02.04-2.

Bush Cabin Run 1

Table 27: Maryland Biological Stream Survey data used to identify Bush Cabin Run 1 as a new Tier II stream.

Sampling Event Identifier	Stream Name	Latitude	Longitude	Catchment Size (Acres)	Data Source	FIBI Score	BIBI Score	Year of Sampling
BA-P-141-206-96	Bush Cabin Run 1	39.608741	-76.690398	1925	Department of Natural Resources	3.33	4.67	1996
LOCH-206-R-2016	Bush Cabin Run 1	39.608741	-76.690398	1925	Department of Natural Resources	4.67	5.00	2016



Figure 9: Map of the newly identified Tier II segment Bush Cabin Run 1.

Table 28: New Tier II segment Bush Cabin Run 1 as it will be displayed in COMAR 26.08.02.04-2.

Date	Stream Name	County	12-digit Watershed	From Lat	From Long	To Lat	To Long	Baseline FIBI	Baseline BIBI
2021	Bush Cabin Run 1	Baltimore Co.	021308050306	39.599083	-76.707107	39.61048	-76.681793	4.00	4.84

Description:

Bush Cabin Run 1 was designated as a Tier II water on the basis of data collected at the DNR Maryland Biological Stream Survey stations BA-P-141-206-96 and LOCH-206-R-2016 that have a average BIBI score of 4.84 and an average FIBI score of 4.00. Since the sites above have an average score greater than 4.00 for both BIBI and FIBI, this stream segment will be designated as Tier II.

Deer Creek 1

Table 29: Maryland Biological Stream Survey data used to identify Deer Creek 1 as a new Tier II stream.

Sampling Event Identifier	Stream Name	Latitude	Longitude	Catchment Size (Acres)	Data Source	FIBI Score	BIBI Score	Year of Sampling
DEER-207-A-2018	Deer Creek 1	39.70916	-76.59561	11008	Maryland Department of the Environment	4.67	4.33	2018

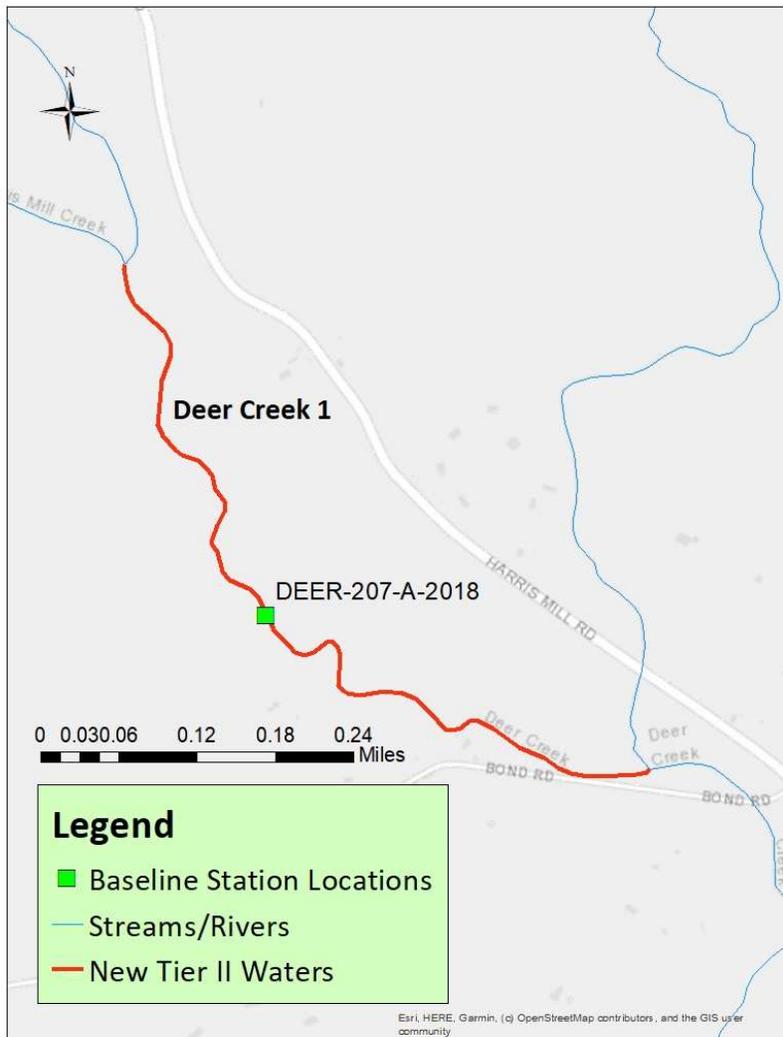


Figure 10: Map of the newly identified Tier II segment Deer Creek 1.

Table 30: New Tier II segment Deer Creek 1 as it will be displayed in COMAR 26.08.02.04-2.

Date	Stream Name	County	12-digit Watershed	From Lat	From Long	To Lat	To Long	Baseline FIBI	Baseline BIBI
2021	Deer Creek 1	Baltimore Co.	021202020332	39.713068	-76.597628	39.70742	-76.590096	4.67	4.33

Description:

Deer Creek 1 was designated as a Tier II water on the basis of data collected from survey station DEER-207-A-2018 by the MDE Field Office. This station has a BIBI score of 4.33 and a FIBI score of 4.67. Since the site above has scores greater than 4.00 for both BIBI and FIBI, this stream segment will be designated as Tier II.

Deer Creek 9

Table 31: Maryland Biological Stream Survey data used to identify Deer Creek 9 as a new Tier II stream.

Sampling Event Identifier	Stream Name	Latitude	Longitude	Catchment Size (Acres)	Data Source	FIBI Score	BIBI Score	Year of Sampling
DEER-304-R-2017	Deer Creek 9	39.714145	-76.597625	8296.66	Department of Natural Resources	4.67	4.67	2017

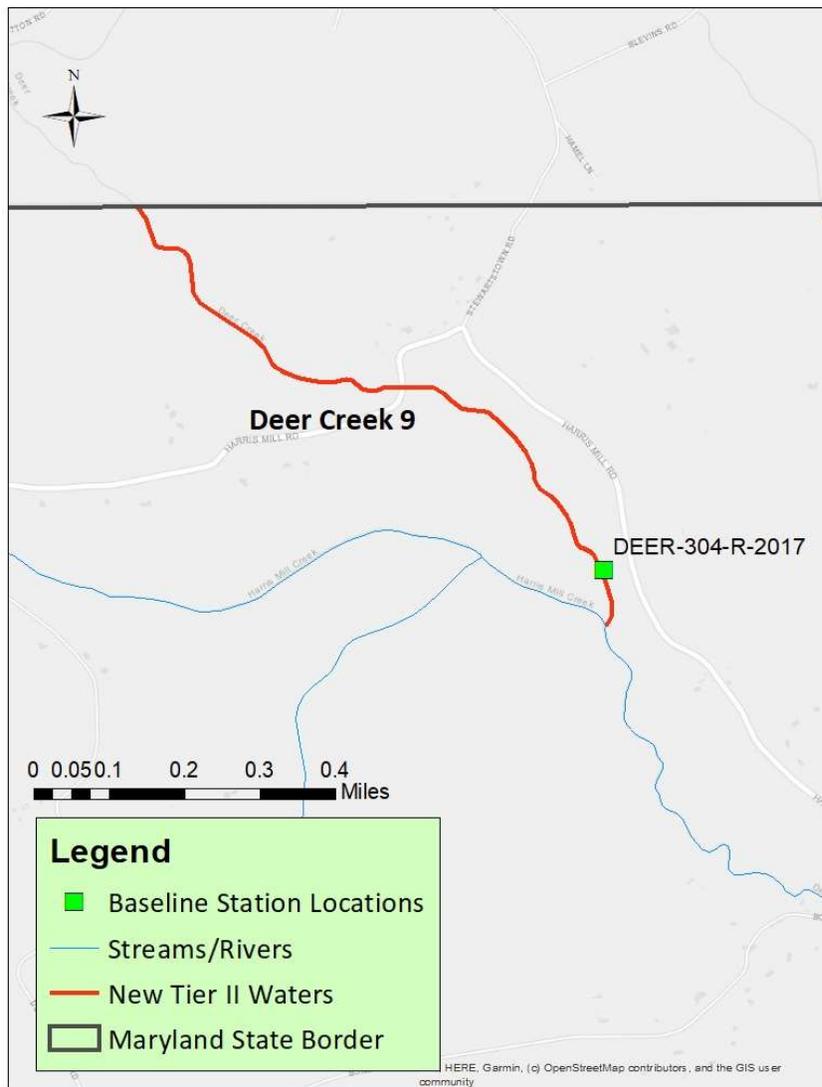


Figure 11: Map of the newly identified Tier II segment Deer Creek 9.

Table 32: New Tier II segment Deer Creek 9 as it will be displayed in COMAR 26.08.02.04-2.

Date	Stream Name	County	12-digit Watershed	From Lat	From Long	To Lat	To Long	Baseline FIBI	Baseline BIBI
2021	Deer Creek 9	Baltimore Co.	021202020332	39.72117	-76.609265	39.713068	-76.597628	4.67	4.67

Description:

Deer Creek 9 was designated as a Tier II water on the basis of data collected at the DNR Maryland Biological Stream Survey station DEER-304-R-2017. This site has a BIBI score of 4.67 and a FIBI score of 4.67. Since the site above has reached a score greater than 4.00 for both BIBI and FIBI, this stream segment will be designated as Tier II and will be added to Tier II protections as listed under COMAR 26.08.02.04-2.

Timothy Branch 1

Table 33: Maryland Biological Stream Survey data used to identify Timothy Branch 1 as a new Tier II stream.

Sampling Event Identifier	Stream Name	Latitude	Longitude	Catchment Size (Acres)	Data Source	FIBI Score	BIBI Score	Year of Sampling
Tim-01	Timothy Branch 1	38.680167	-76.867528	1516.8	Wetland Studies and Solutions	4.33	4.14	2020
MATT-101-X-2015	Timothy Branch 1	38.66792	-76.87347	1819.516	Department of Natural Resources	4.67	4.14	2015

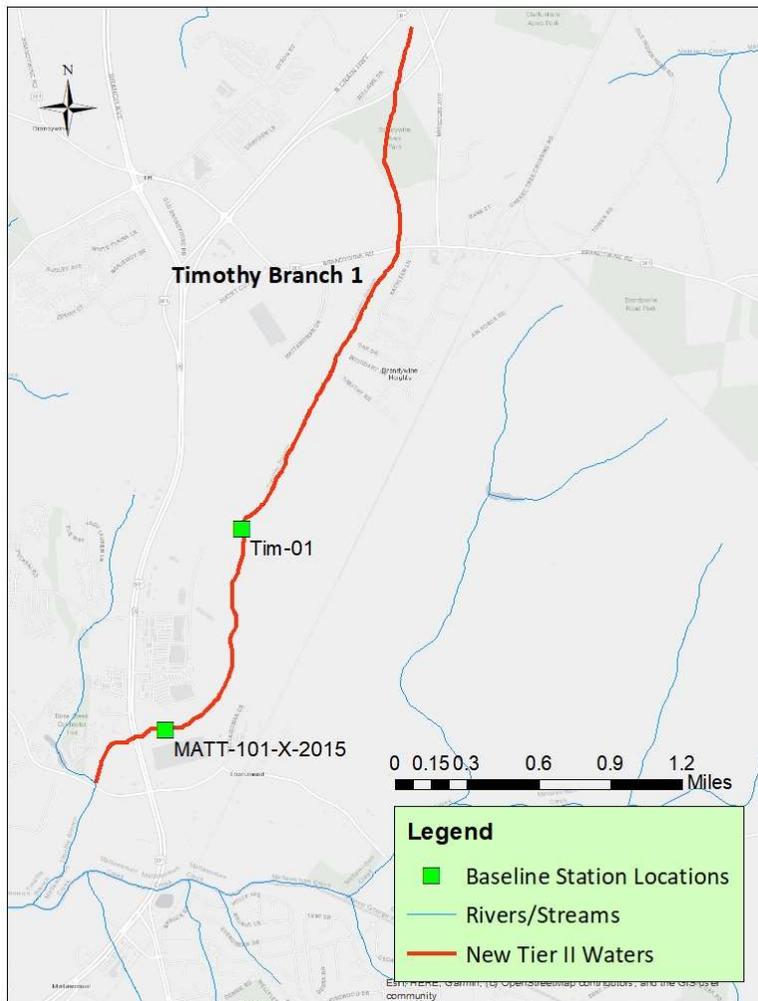


Figure 12: Map of the newly identified Tier II segment Timothy Branch 1.

Table 34: New Tier II segment Timothy Branch 1 as it will be displayed in COMAR 26.08.02.04-2.

Date	Stream Name	County	12-digit Watershed	From Lat	From Long	To Lat	To Long	Baseline FIBI	Baseline BIBI
2021	Timothy Branch	Prince George's	021401110787	38.710667	-76.854371	38.664667	-76.878959	4.50	4.14

Description:

Timothy Branch 1 was designated as a Tier II water on the basis of data collected from two sampling events; one sampled by the DNR Maryland Biological Stream Survey program (station MATT-101-X-2015) and another sampled by Wetland Studies and Solutions (station Tim-01), a water quality consultant that met the required quality assurance protocols. These two stations result in an average BIBI score of 4.50 and an average FIBI score of 4.14. Since both the average BIBI and FIBI scores are equal to or greater than 4.00, this stream segment will be designated as Tier II and added to the list of Tier II waters in COMAR 26.08.02.04-2.

Mill Run 5 (Charles County)

Table 35: Maryland Biological Stream Survey data used to identify Mill Run 5 as a new Tier II stream.

Sampling Event Identifier	Stream Name	Latitude	Longitude	Catchment Size (Acres)	Data Source	FIBI Score	BIBI Score	Year of Sampling
NANJ-MDS2-01	Mill Run 5	38.526092	-77.082914	1542.4	McCormick Taylor, Inc.	4.00	4.43	2019

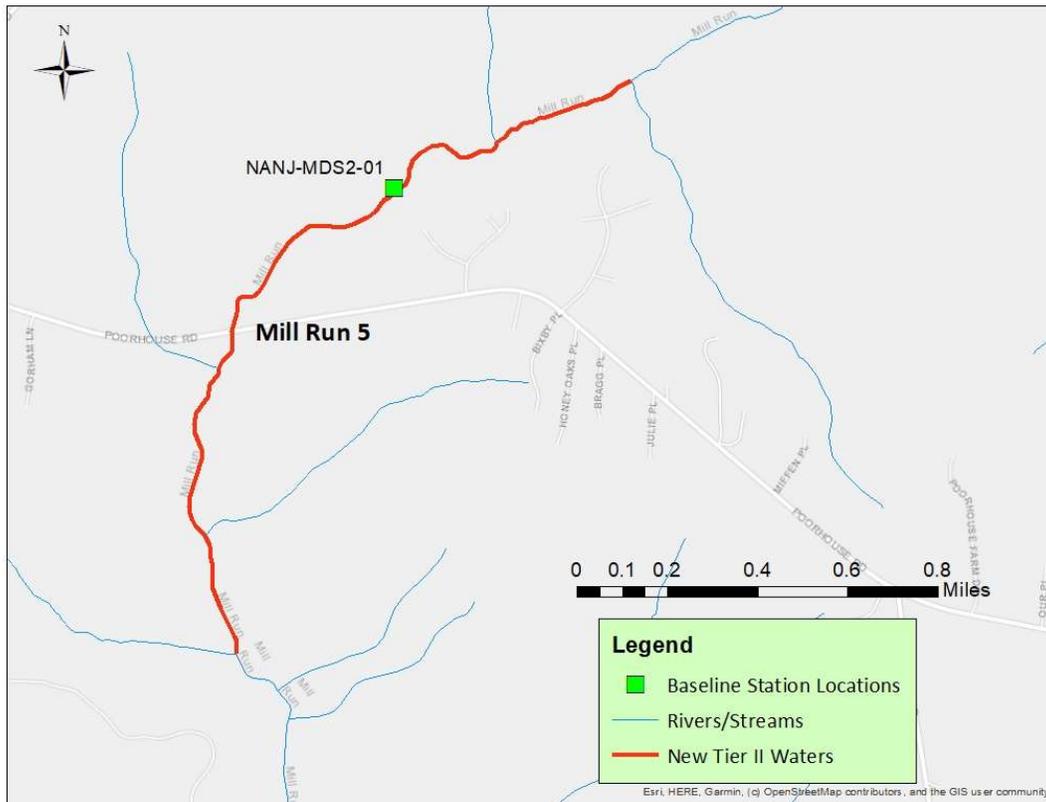


Figure 13: Map of the newly identified Tier II segment Mill Run 5.

Table 36: New Tier II segment Mill Run 5 as it will be displayed in COMAR 26.08.02.04-2.

Date	Stream Name	County	12-digit Watershed	From Lat	From Long	To Lat	To Long	Baseline FIBI	Baseline BIBI
2021	Mill Run 5	Charles	021401100779	38.52755	-77.078741	38.52029	-77.090089	4.00	4.43

Description:

Mill Run 5 was designated as a Tier II water on the basis of data collected by McCormick Taylor, Inc., an environmental consultant that met the required quality assurance protocols. Station NANJ-MDS2-01 had a BIBI score of 4.00 and a FIBI score of 4.43. Since this site had both a BIBI and FIBI equal to or greater than 4.00, this stream segment will be designated as Tier II and will be added to the list of Tier II waters in COMAR 26.08.02.04-2.

Wilson Owens Branch 1

Table 37: Maryland Biological Stream Survey data used to identify Wilson Owens Branch 1 as a new Tier II stream.

Sampling Event Identifier	Stream Name	Latitude	Longitude	Catchment Size (Acres)	Data Source	FIBI Score	BIBI Score	Year of Sampling
PAXM-201-X-2014	Wilson Owens Branch 1	38.82668	-76.69377	182.81	Department of Natural Resources	4.67	4.14	2014

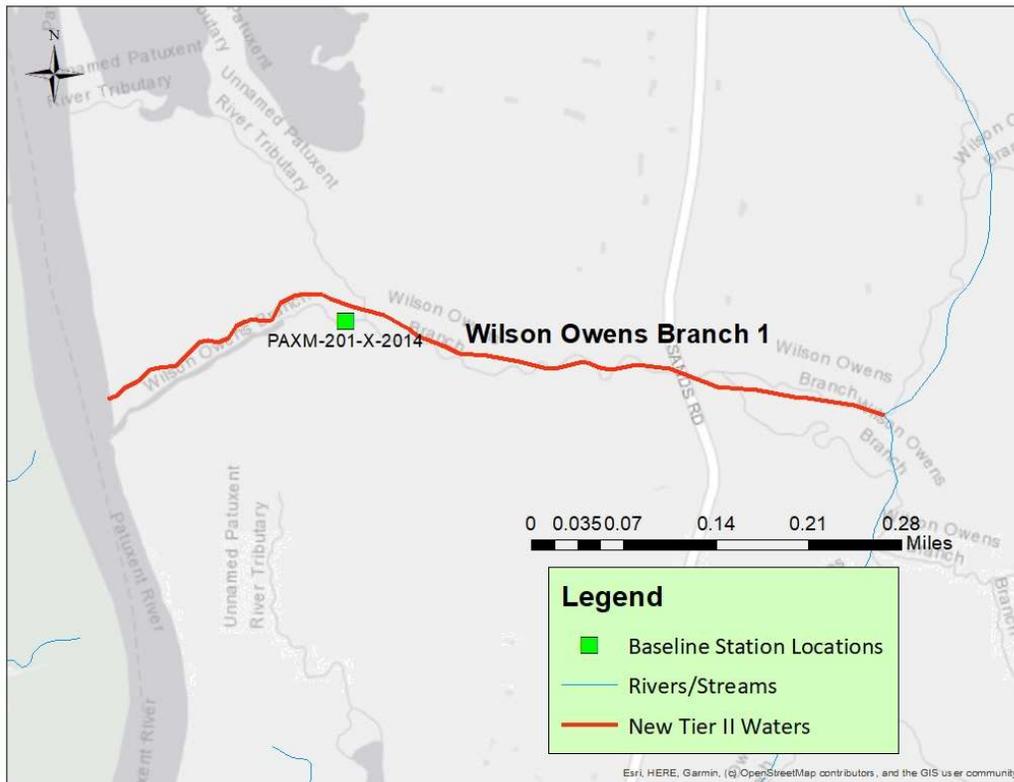


Figure 14: Map of the newly identified Tier II segment Wilson Owens Branch 1.

Table 38: New Tier II segment Wilson Owens Branch 1 as it will be displayed in COMAR 26.08.02.04-2.

Date	Stream Name	County	12-digit Watershed	From Lat	From Long	To Lat	To Long	Baseline FIBI	Baseline BIBI
2021	Wilson Owens Branch 1	Anne Arundel	0213111020914	38.825626	-76.68624	38.825834	-76.697119	4.67	4.14

Description:

Wilson Owens Branch 1 was designated as a Tier II water on the basis of data collected at the DNR Maryland Biological Stream Survey station PAXM-201-X-2014 that has a BIBI score of 4.14 and a FIBI score of 4.67. Since this site had both a BIBI and FIBI equal to or greater than 4.00, this stream segment will be designated as Tier II and will be added to the list of Tier II waters in COMAR 26.08.02.04-2.

District Branch 1

Table 39: Maryland Biological Stream Survey data used to identify District Branch 1 as a new Tier II stream.

Sampling Event Identifier	Stream Name	Latitude	Longitude	Catchment Size (Acres)	Data Source	FIBI Score	BIBI Score	Year of Sampling
PAXM-109-R-2001	District Branch 1	38.857424	-76.69872	1308.421	Department of Natural Resources	4.67	3.00	2001
PAXM-109-R-2015	District Branch 1	38.857424	-76.69872	1308.421	Department of Natural Resources	4.00	5.00	2015

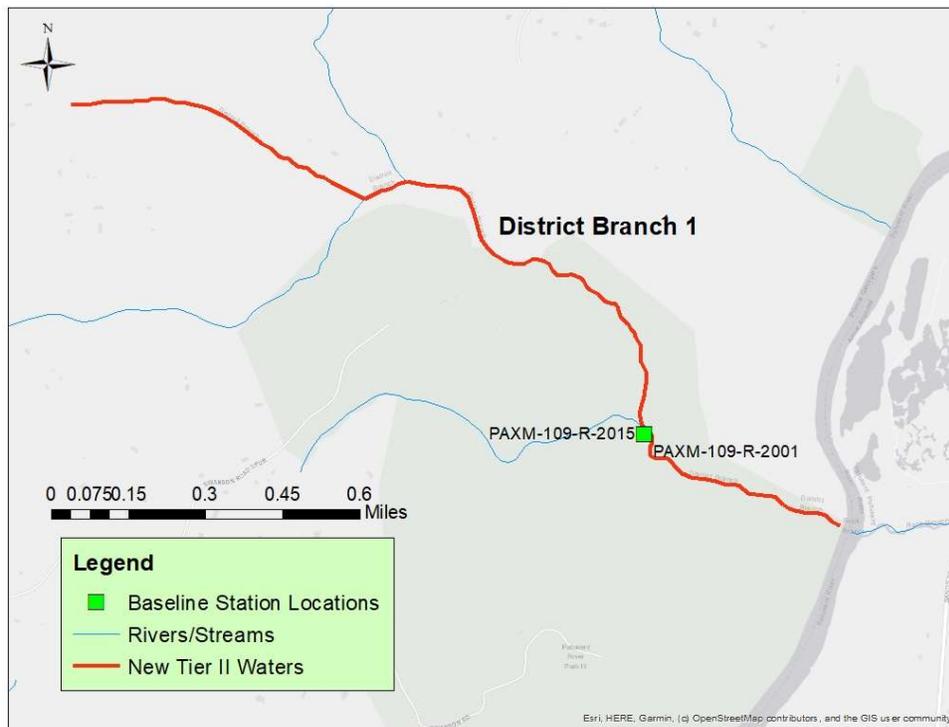


Figure 15: Map of the newly identified Tier II segment District Branch 1.

Table 40: New Tier II segment District Branch 1 as it will be displayed in COMAR 26.08.02.04-2.

Date	Stream Name	County	12-digit Watershed	From Lat	From Long	To Lat	To Long	Baseline FIBI	Baseline BIBI
2021	District Branch 1	Prince George's	021311020917	38.866772	-76.719393	38.854804	-76.691683	4.34	4.00

Description:

District Branch 1 was designated as a Tier II water on the basis of data collected at the DNR Maryland Biological Stream Survey stations PAXM-109-R-2001 and PAXM-109-R-2015 that have an average BIBI score of 4.00 and an average FIBI score of 4.34. Since the average of both the BIBI and FIBI are equal to or greater than 4.00, this stream segment will be designated as Tier II and will be added to the list of Tier II waters in COMAR 26.08.02.04-2.

Morgan Creek UT 1

Table 41: Maryland Biological Stream Survey data used to identify Morgan Creek UT 1 as a new Tier II stream.

Sampling Event Identifier	Stream Name	Latitude	Longitude	Catchment Size (Acres)	Data Source	FIBI Score	BIBI Score	Year of Sampling
MICR-208-R-2002	Morgan Creek UT 1	39.302815	-76.016998	2360.17	Department of Natural Resources	4.67	3.86	2002
MICR-208-R-2016	Morgan Creek UT 1	39.30313	-76.01669	2360.495223	Department of Natural Resources	3.67	4.14	2016

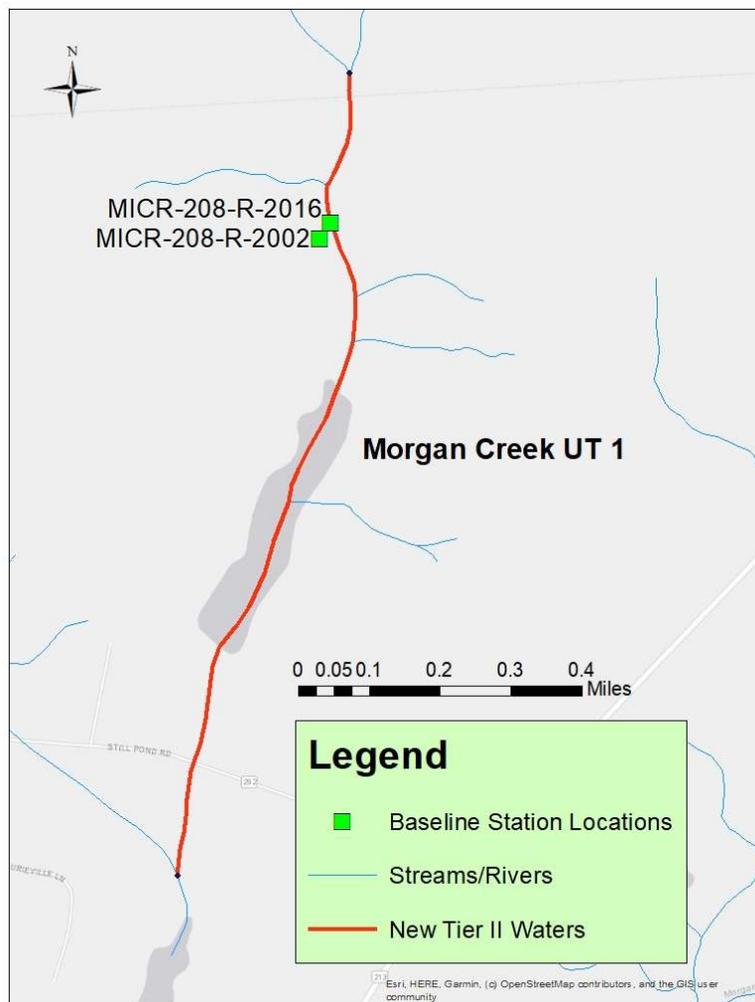


Figure 16: Map of the newly identified Tier II segment Morgan Creek UT 1.

Table 42: New Tier II segment Morgan Creek UT 1 as it will be displayed in COMAR 26.08.02.04-2.

Date	Stream Name	County	12-digit Watershed	From Lat	From Long	To Lat	To Long	Baseline FIBI	Baseline BIBI
2021	Morgan Creek UT 1	Kent	021305090415	39.306198	-76.016172	39.289815	-76.020911	4.27	4.00

Description:

Morgan Creek UT 1 was designated as a Tier II water on the basis of data collected at the DNR Maryland Biological Stream Survey stations MICR-208-R-2002 and MICR-208-R-2016 that have an average BIBI score of 4.00 and an average FIBI score of 4.27. Since the average of both the BIBI and FIBI are equal to or greater than 4.00, this stream segment will be designated as Tier II and will be added to the list of Tier II waters in COMAR 26.08.02.04-2.

Fannels Branch 1

Table 43: Maryland Biological Stream Survey data used to identify Fannels Branch 1 as a new Tier II stream.

Sampling Event Identifier	Stream Name	Latitude	Longitude	Catchment Size (Acres)	Data Source	FIBI Score	BIBI Score	Year of Sampling
LANG-204-R-2002	Fannels Branch 1	39.188499	-76.10934	3476.61	Department of Natural Resources	4.67	3.86	2002
LANG-204-R-2016	Fannels Branch 1	39.18859	-76.10943	3479.361952	Department of Natural Resources	3.67	4.14	2016

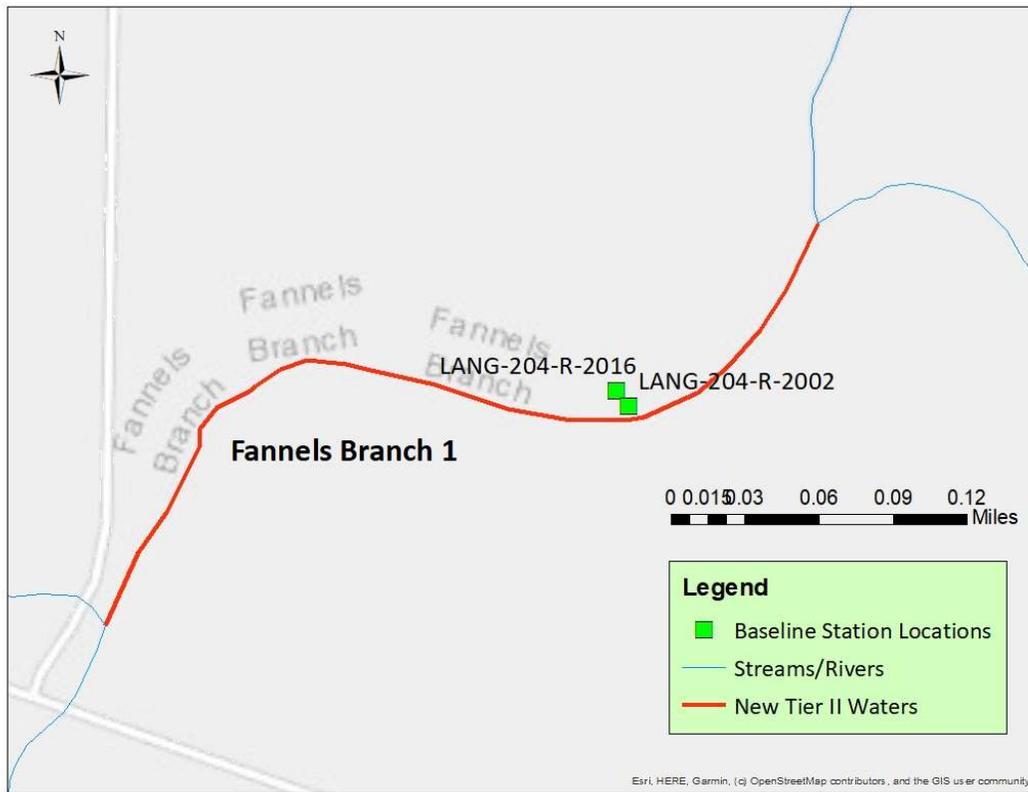


Figure 17: Map of the newly identified Tier II segment Fannels Branch 1.

Table 44: New Tier II segment Fannels Branch 1 as it will be displayed in COMAR 26.08.02.04-2.

Date	Stream Name	County	12-digit Watershed	From Lat	From Long	To Lat	To Long	Baseline FIBI	Baseline BIBI
2021	Fannels Branch 1	Kent	021305060409	39.189562	-76.107898	39.187236	-76.113317	4.17	4.00

Description:

Fannels Branch 1 was designated as a Tier II water on the basis of data collected at the DNR Maryland Biological Stream Survey stations LANG-204-R-2002 and LANG-204-R-2016 that have an average BIBI score of 4.00 and an average FIBI score of 4.17. Since the average of both the BIBI and FIBI are equal to or greater than 4.00, this stream segment will be designated as Tier II and will be added to the list of Tier II waters in COMAR 26.08.02.04-2.